Technology Deployment Initiatives and Partnership Program
Request for Funding
FY 2000

Project Title: Glacier National Park Wall Management Program

Problem Statement:

Dating back to the early 1920's, most retaining walls and guardwalls within Glacier National Park have deteriorated with time, and have had little maintenance since their initial construction. Many of the walls are in need of repair and maintenance as documented in the 1997 Retaining Wall Inventory Update. Continued unchecked deterioration, particularly of the stone masonry walls, will lead to increased total wall costs and can ultimately lead to major and even catastrophic failures. The network of retaining walls and guardwalls need to be managed in a rigorous fashion to ensure the safety and the integrity of these features, as well as protect the cultural heritage they represent to the park.

Proposal: (including expected output and implementation)

A systematic approach is required to manage the retaining walls and guardwalls with the following objectives:

- provide the basic data for the Park to manage the Glacier walls
- fully identify all walls existing in Glacier NP
- develop an ongoing awareness of individual wall condition
- develop action plans to repair and mitigate existing and potential wall damage
- be proactive in repairing the walls before the problems increase and result in major expense or road closure
- aid in program planning
- to develop details of an ongoing inspection program
- reference all walls to a single survey system
- incorporate previous studies with different reference system into one system

To meet these objectives a management system will be developed with the following key elements:

- A complete inventory of all retaining walls and guardwalls
- An ongoing condition survey consisting of a regular inspection program where 1/3 of the walls are inspected in detail yearly
- A database inventory identifying walls, tracking inspection records, characterizing the severity and extent of deterioration of wall elements, defining costs to support the management program, and any supplemental data
- A rationale and systematic procedure to:
    - Predict deterioration of walls
    - Identify feasible actions to improve condition, safety, and serviceability

- Estimate the cost of alternatives
- Estimate maintenance savings and user benefits due to improvements
- Determine least-cost maintenance, repair, and rehabilitation strategies for walls using life cycle cost analysis or a comparable procedure
- Perform multi-period optimization analyses (e.g., 5-7-10 periods) as to when to do work
- Generate reports and summaries as needed for planning and programming

- Develop a process for monitoring the status of actions taken and to update the database and procedures.

The management system will be based on the current inventory of 127 walls and the data elements captured to date.

Benefits:

A wall management system will enable improved management of aging wall systems, especially in the National Parks. The system will include identification of appropriate alternative maintenance, preservation, and rehabilitation practices. The implementation of routine inspection and inventory updates will provide the increased importance to monitoring aging wall systems.

Estimated Resources/Cost: The system architecture and format development by a contractor is estimated to be $50,000. The monitoring of the contract by the Champion is anticipated to require about 1% of work time during the duration. The coordination with other professionals including the FLH Divisions and showcasing is expected to require 40 hours during the duration.

Duration: The development of the system architecture and format is anticipated to take twelve months. Each showcase of the system is estimated to require 8 hours.

Suggested Organization/Method: Contract for services to develop the architecture and format. Coordination and Showcase presentation will be by the Champion.

Submitter:

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Champion:

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